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Childhood Maltreatment Predicts Poor Economic and Educational Outcomes in the Transition to Adulthood

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Objectives. To test whether childhood maltreatment was a predictor of (1) having low educational qualifications and (2) not being in education, employment, or training among young adults in the United Kingdom today.

Methods. Participants were from the Environmental Risk (E-Risk) Longitudinal Twin Study, a nationally representative UK cohort of 2232 twins born in 1994 to 1995. Mothers reported on child maltreatment when participants were aged 5, 7, 10, and 12 years. Participants were interviewed about their vocational status at age 18 years.

Results. The unadjusted odds of having low educational qualifications or of not being in education, employment, or training at age 18 years were more than 2 times greater for young people with a childhood history of maltreatment versus those without. These associations were reduced after adjustments for individual and family characteristics. Youths who reported having a supportive adult in their lives had better education outcomes than did youths who had less support.

Conclusions. Closer collaboration between the child welfare and education systems is warranted to improve vocational outcomes for maltreated youths. (*Am J Public Health.* 2018;108:1142–1147. doi:10.2105/AJPH.2018.304587)



See also Merrick and Guinn, p. 1117; Tarantola, p. 1119; Henry et al., p. 1134; and Schofield et al., p. 1148.

Young people who are currently transitioning to adulthood face a challenging labor market and path to financial independence.¹ In the United States, unemployment rates have risen since 2000 for adolescents and young adults.^{1,2} European youths face similar challenges.³ The transition to adulthood is a critical point at which to alter trajectories for youths who are unemployed and have few, if any, educational qualifications. Predicting which young people are at highest risk for not being in education, employment, or training (NEET) is crucial to accurately target preventive services.

A childhood history of maltreatment (e.g., abuse or neglect) is 1 such predictor of educational and employment outcomes.⁴ Relatively high rates of school dropout and unemployment among young people with histories of maltreatment could reflect a causal process by which abuse and neglect result in cognitive impairments, poor mental health,

or physical health problems that impinge on academic achievement and employment prospects. For example, youths who are exposed to abuse and neglect are at risk for emotional, behavioral, and academic problems that are predictive of school dropout and unemployment.^{5,6} A second possibility is that the association between childhood maltreatment and adult education and

employment outcomes is noncausal. For example, childhood maltreatment co-occurs with other robust risk factors for poor socioeconomic outcomes, namely family- and neighborhood-level poverty.⁷

A number of studies have shown that the associations between maltreatment and poor education and employment outcomes become nonsignificant once adjustments are made for individual- and family-level risk factors such as IQ or family socioeconomic background.^{8–10} By contrast, other studies have identified unique effects of childhood maltreatment on adult socioeconomic outcomes, even after accounting for co-occurring risk factors.¹¹ Finally, individuals with court-substantiated records of abuse and neglect who were followed prospectively into middle-adulthood had fewer educational qualifications and lower earnings, were only half as likely to be in a skilled job or to be employed, and were less likely to have assets such as stocks or a vehicle compared with demographically matched controls.¹²

The current study is well suited to distinguish between social selection and social causation hypotheses about the relationship between childhood maltreatment and education and employment outcomes during the transition to adulthood. A social causation account posits that maltreatment negatively

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influences educational and employment prospects, possibly by producing cognitive impairments and behavioral problems that interfere with learning and other skills needed to succeed in school or the workplace. By contrast, a social selection account posits that maltreatment co-occurs with socioeconomic disadvantage or that maltreated youths inherit risks for cognitive, emotional, or behavioral problems that could be the true causes of poor educational and employment outcomes.

This study comprises prospective, longitudinal data from a nationally representative sample of young people in the United Kingdom and includes measures of family and neighborhood poverty that could account for observed associations between maltreatment and education and employment outcomes. By controlling for measures of parental psychopathology assessed when the study members were children, we tested the hypothesis that maltreated youths inherit risks for psychopathology that derail their education and employment prospects. We further tested whether mental health problems in early adolescence explain the effects. We investigated whether having a supportive relationship with an adult and neighborhood conditions at the start of adolescence moderate effects of childhood maltreatment on education and employment outcomes. Nonparental mentoring relationships have been shown to matter for youths in foster care, promoting elevated rates of participation in higher education.¹³ We also tested whether, in contrast, neighborhood disadvantage amplifies adverse effects of maltreatment on education and employment outcomes. Neighborhood violence (which tends to co-occur with neighborhood socioeconomic disadvantage) could become an impediment to job seeking or school attendance for youths with maltreatment-related anxiety or post-traumatic stress symptoms, or underresourced schools could be especially likely to use suspensions or expulsions to discipline youths with maltreatment-related problem behaviors.

METHODS

Participants were members of the Environmental Risk (E-Risk) Longitudinal Twin Study, a birth cohort of 2232 British children. The sample was drawn from a larger birth

register of twins born in England and Wales in 1994 to 1995. Full details about the sample are reported elsewhere.¹⁴ The E-Risk sample was constructed from 1999 to 2000, when 1116 families (93% of those eligible) with same-sex 5-year-old twins participated in home-visit assessments. This sample comprised 56% monozygotic and 44% dizygotic twin pairs; sex was evenly distributed within zygosity (49% male) and 6% of the sample self-identified as Black, Asian, or mixed race. Families were recruited to represent the UK population with newborns in the 1990s on the basis of residential location throughout England and Wales and mother's age. Female adolescents with twins were overselected to replace high-risk families who were selectively lost to the register through non-response. Older women who had twins via assisted reproduction were underselected to avoid an excess of well-educated older women. At follow-up, the study sample represented the full range of socioeconomic conditions in the United Kingdom.¹⁵

Follow-up home visits were conducted when children were aged 7 years (98% participation), 10 years (96% participation), 12 years (96% participation), and 18 years (93% participation). At age 18 years, 2066 participants were assessed, each twin by a different interviewer. The average age at the time of assessment was 18.4 years ($SD = 0.36$); all interviews were conducted after the 18th birthday. There were no differences between those who did and did not take part at age 18 years in terms of socioeconomic status (SES) assessed when the cohort was initially defined ($\chi^2 = 0.86$; $P = .65$), age-5 IQ scores ($t = 0.98$; $P = .33$), age-5 internalizing or externalizing behavior problems ($t = 0.40$; $P = .69$ and $t = 0.41$; $P = .68$, respectively), or childhood maltreatment ($\chi^2 = 1.53$; $P = .47$). Home visits at ages 5, 7, 10, and 12 years included assessments with participants as well as their mother (or primary caretaker); the home visits at age 18 years included interviews only with the participants.

Measures

Physical maltreatment by an adult. When the participants were aged 5, 7, 10, and 12 years, we interviewed their mothers about their children's experience of intentional harm by an adult. At age 5 years, we used the standardized clinical protocol from the

MultiSite Child Development Project.¹⁶ At ages 7, 10, and 12 years, we modified this interview to expand its coverage of contexts for child harm. Specifically, mothers were asked whether either of their children had been intentionally harmed (physically or sexually) by an adult or had contact with welfare agencies. If caregivers endorsed a question, interviewers made extensive notes on what had happened and indicated whether physical or psychological harm had occurred. Under the UK Children Act, our responsibility was to secure intervention if maltreatment was current and ongoing. Such intervention on behalf of E-Risk families was carried out with parental cooperation in all but 1 case. No families left the study following intervention. Over the years of data collection, the study developed a cumulative profile for each child, comprising the caregiver reports, recorded debriefings with interviewers who had coded any indication of maltreatment at any of the successive home visits, recorded narratives of the successive caregiver interviews, and information from clinicians whenever the study team made a child-protection referral. The profiles were reviewed at the end of the age-12 phase by 2 clinical psychologists and were coded 0 if there was no maltreatment at any age (78.9%) and 1 if there was maltreatment at any age (21.1%). Initial interrater agreement between the coders exceeded 90% and discrepantly coded cases were resolved by consensus review.

Educational attainment. In the United Kingdom, students are eligible to leave school upon completion of the General Certificate of Secondary Education (GCSE) examination at age 16 years. Some students remain in school for an additional 2 years to complete A-level (or equivalent) qualifications, which are required for university entrance. Participants with poor educational qualifications were those who did not obtain their A-level qualifications or scored a low grade (D–G) on their examination (21.9% participants).

Not in education, employment, or training. At the time of their age-18 interview, we classified participants as NEET if they reported that they were not studying, nor working in paid employment, nor pursuing a vocational qualification or apprenticeship training (11.6%).¹⁷ This operationalization of NEET status follows that used by the UK Office of National Statistics and the International Labor

Organization.¹⁸ Participants were queried to ensure that NEET status was not simply a function of being on summer holiday or of being a stay-at-home parent. Employment- and education-related queries were from the Longitudinal Study of Young People in England (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/181542/DFE-RR033.pdf).

A Classification of Residential Neighborhoods.

We defined neighborhood-level socioeconomic index by using A Classification of Residential Neighborhoods.¹⁵ A Classification of Residential Neighborhoods uses data from the 2001 census and other survey-based geodemographic discriminators to classify enumeration districts (approximately 150 households) into socioeconomic groups ranging from “wealthy achievers” (category 1) with high incomes, large single-family houses, and access to many amenities, to “hard pressed” neighborhoods (category 5) dominated by government-subsidized housing estates, low incomes, high unemployment, and single parents. Families living in “hard-pressed” and “moderate means” neighborhoods were grouped into 1 category and those in “wealthy achiever,” “urban prosperity,” and “comfortably off” neighborhoods were grouped into a second category.

Adult involvement. At age 12 years, youths were asked questions about whether they had a stable adult figure to rely on for basic needs (e.g., “there is an adult who I can tell almost anything to,” “there is an adult who can take me places if I need to be somewhere”). Participants answered not true (0), sometimes true (1), or true (2). We derived a total scale by summing the scores of the 13 items (mean = 23.78; SD = 3.44; $\alpha = 0.85$).

Covariates. We controlled for a range of individual and family-level factors in analyses because they tend to be associated with child maltreatment as well as educational and employment outcomes and could confound observed associations. See Table 1 for a description of these measures.

Statistical Analysis

We conducted hierarchical logistic regression analyses to determine whether maltreatment was associated with (1) poor educational qualifications or (2) NEET status, adjusting for covariates. We entered

TABLE 1—Description of Covariates: Environmental Risk (E-Risk) Longitudinal Twin Study, United Kingdom

Measure	Description
Family SES, tertiles	Standardized composite of parents' income, education, and social class ascertained at childhood phases of the study, which loaded significantly onto 1 latent factor. ¹⁹
Youth IQ	Assessed at age 5 y with the Vocabulary and Block Design subtests of the Wechsler Preschool and Primary Scale of Intelligence-Revised. ²⁰ Full-scale IQ was estimated from the subtests following procedures described by Sattler. ²¹ (p999-1004) Childhood IQ was standardized to a mean of 100 and SD of 15.
Maternal lifetime depression	Assessed when participants were aged 5 y using the DIS ²² according to <i>DSM-IV</i> criteria; 35% of mothers who experienced at least 1 episode of depression.
Parental antisocial personality	Reported by mothers when participants were aged 5 y, using the Young Adult Behavior Checklist ²¹ for fathers and the Young Adult Self-Report for mothers. ²³ These were modified to obtain lifetime data and supplemented with questions from the DIS ²² that assessed the (lifetime) presence of <i>DSM-IV</i> symptoms of antisocial personality disorder (e.g., deceitfulness, aggressiveness). In 27.6% of E-Risk families, at least 1 parent had 3 or more symptoms of antisocial personality.
Parental substance abuse	When participants were aged 5 y, mothers reported on their own and the biological father's substance use by using the short Michigan Alcoholism Screening Test ²⁴ and the Drug Abuse Screening Test. ²⁵ Among E-Risk families, 25.5% of parents had 4 or more symptoms of substance abuse—a cut-off that shows good agreement with clinical diagnoses of alcoholism.
Youth psychopathology	A count of the following mental health problems: ADHD, CD, depression, anxiety, and substance use (age 12 y), mean = 0.57; SD = 0.90. ADHD and CD were reported by teachers and parents when youths were aged 5, 7, 10, and 12 y by using the Child Behavior Checklist. Depression, anxiety, and substance use were reported by children at age 12 y by using, respectively, the Childhood Depression Inventory, the Manifest Anxiety Scale for Children, and questions about alcohol, cigarette, or other drug use. For additional details on these measures, see Goldman-Mellor et al. ¹⁷

Note. ADHD = attention deficit/hyperactivity disorder; CD = conduct disorder; DIS = Diagnostic Interview Schedule; *DSM-IV* = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (Washington, DC: American Psychiatric Association; 1994); SES = socioeconomic status.

maltreatment status at the first step, followed by demographic characteristics and age-5 IQ, measures of parent psychopathology, and measures of youth psychopathology. We entered adult involvement and neighborhood poverty at the fifth step and we entered the interactions between these variables and maltreatment status at the final step in the model. Sex did not moderate the effect of maltreatment on educational qualifications or NEET; thus, we presented the findings

together across the 2 genders. We adjusted standard errors for the nonindependence of twin data by using the Huber–White variance estimator.²⁶

RESULTS

Young adults with a childhood history of maltreatment differed from those without a history of maltreatment on education and

TABLE 2—Associations Between Childhood History of Maltreatment, Education, and Not Being in Education, Employment, or Training, and Covariates: Environmental Risk (E-Risk) Longitudinal Twin Study, United Kingdom, 1999–2001 and 2012–2014

	Childhood Physical Maltreatment, % (No.) or Mean \pm SD	No Childhood Physical Maltreatment, % (No.) or Mean \pm SD	OR (95% CI)
Outcome Variables			
Poor educational qualifications	33 (146)	19 (305)	2.18 (1.65, 2.88)
NEET	18 (79)	10 (160)	2.01 (1.45, 2.79)
Covariates			
Male	55 (259)	47 (833)	1.35 (1.04, 1.77)
Socioeconomic status			
High	23 (109)	37 (643)	
Moderate	27 (128)	35 (610)	1.24 (0.86, 1.78)
Low	50 (235)	29 (507)	2.73 (1.96, 3.81)
IQ age 5 y	97.29 \pm 15.43	100.72 \pm 14.80	0.98 (0.98, 0.99)
Maternal depression	49 (231)	31 (549)	2.13 (1.62, 2.79)
Parental antisocial personality	49 (230)	22 (384)	3.44 (2.61, 4.54)
Parental substance problems	42 (196)	21 (370)	2.71 (2.04, 3.59)
Count of youth mental health problems, age 12 y	0.94 \pm 1.13	0.47 \pm 0.80	1.66 (1.48, 1.87)
Adult involvement	23.00 \pm 4.26	23.99 \pm 3.15	0.93 (0.90, 0.96)
Neighborhood poverty	46 (207)	38 (637)	1.41 (1.07, 1.86)

Note. CI = confidence interval; NEET = not in education, employment, or training; OR = odds ratio.

employment outcomes (Table 2) and on the covariates included in the models (Table 2). Table 3 shows bivariate associations between

covariates and education and employment outcomes; except for male gender, moderate SES, and maternal depression, which were

TABLE 3—Bivariate Associations Between Covariates and Education and Employment Outcomes: Environmental Risk (E-Risk) Longitudinal Twin Study, United Kingdom, 1999–2001 and 2012–2014

Covariates	Poor Educational Qualifications, OR (95% CI)	NEET, OR (95% CI)
Physical maltreatment	2.18 (1.65, 2.88)	2.01 (1.45, 2.79)
Male	1.46 (1.13, 1.88)	0.90 (0.65, 1.24)
Socioeconomic status		
High (Ref)	1	1
Moderate	3.76 (2.53, 5.57)	1.41 (0.84, 2.37)
Low	8.95 (6.15, 13.02)	5.47 (3.51, 8.51)
Youth IQ	0.94 (0.93, 0.95)	0.96 (0.95, 0.97)
Maternal depression	1.30 (1.00, 1.68)	1.31 (0.94, 1.81)
Parental antisocial personality	1.78 (1.36, 2.33)	1.57 (1.12, 2.19)
Parental substance problems	2.05 (1.56, 2.69)	1.73 (1.23, 2.43)
Count of youth mental health problems, age 12 y	2.15 (1.89, 2.43)	1.71 (1.49, 1.97)
Adult involvement	0.89 (0.86, 0.91)	0.93 (0.90, 0.96)
Neighborhood poverty	2.41 (1.87, 3.12)	2.50 (1.80, 3.48)

Note. CI = confidence interval; NEET = not in education, employment, or training; OR = odds ratio.

not associated with NEET, all other associations were significant.

Educational Qualifications

The odds of having poor educational qualifications were more than 2 times greater for youths with a history of maltreatment versus those without (Table 3). The association between maltreatment and educational qualifications remained significant, but was reduced, after we adjusted for sex, family SES, parental psychopathology, and IQ at age 5 years (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). The association was reduced to nonsignificance after we adjusted for the count of youth mental health problems at age 12 years, which explained an additional 8.7% of the effect of maltreatment on educational outcomes beyond that explained by sex, family SES, parental psychopathology, and IQ at age 5 years (Table A). Youths who reported higher levels of adult involvement in their lives were relatively less likely to have poor educational qualifications than were youths who reported lower levels of adult involvement, but neighborhood poverty was not associated with educational qualifications (Table 4). When we adjusted for all covariates, the effect of maltreatment was not moderated by adult involvement (odds ratio [OR] = 1.02; 95% confidence interval [CI] = 0.96, 1.09) or by neighborhood poverty (OR = 1.03; 95% CI = 0.55, 1.92).

Not Being in Education, Employment, or Training

The odds of NEET were twice as great for youths with a history of maltreatment versus those without (Table 3). The association between maltreatment and NEET status remained significant but was reduced after we adjusted for sex, family SES, parent psychopathology, and IQ at age 5 years (Table B, available as a supplement to the online version of this article at <http://www.ajph.org>). The association was reduced to nonsignificance after we adjusted for the count of youth mental health problems at age 12 years, which explained an additional 6.9% of the effect of maltreatment on NEET beyond that explained by sex, family SES, parental psychopathology, and IQ at age 5 years (Table B). Neither adult involvement nor

neighborhood poverty were associated with NEET status (Table 4). When we adjusted for all covariates, the effect of maltreatment was not moderated by adult involvement (OR = 1.04; 95% CI = 0.97, 1.11) or neighborhood poverty (OR = 0.88; 95% CI = 0.44, 1.77).

DISCUSSION

Using data from a nationally representative sample of young adults in the United Kingdom, we found that those who had childhood histories of maltreatment were at elevated risk for having poor educational qualifications and for being NEET. The current study failed to support a range of alternative explanations for this association. First, maltreatment was not merely a marker for being raised in an environment with scarce social capital or for low IQ. Second, maltreatment was not merely a marker for a liability to psychopathology that parents transmit to children and that adversely affects young people's education and employment prospects. Findings were more consistent with the possibility of social causation versus social selection, whereby maltreatment jeopardizes education and employment prospects by increasing the risk

of poor mental health in childhood. As predicted, youths who reported having an adult they could relate to in their lives were less at risk for poor education outcomes at age 18 years, but contrary to predictions, this was true for both maltreated and nonmaltreated youths. Although living in a disadvantaged neighborhood was associated at the bivariate level with having poor educational qualifications and with being NEET, this association was reduced to nonsignificance once individual and family-level covariates were adjusted and, contrary to predictions, neighborhood disadvantage did not amplify the effect of maltreatment.

Limitations

Although the current study employed many statistical controls, the data were observational, and unmeasured variables could be confounders. Sibling fixed-effects models could potentially control for unobserved heterogeneity, but only 4.7% of E-Risk twins were discordant for maltreatment and only a subset of those were also discordant for educational or employment outcomes. Although the NEET rate in the E-Risk sample of twins matches that in the United Kingdom as a whole (11.6% vs 12.5%), research is needed in singleton samples outside the

United Kingdom to determine whether findings generalize beyond the UK educational system. Finally, although there is little evidence that caregivers failed to report abuse or neglect that was later disclosed by twins,²⁷ caregiver reports of child maltreatment may be prone to recall biases or be influenced by characteristics of the caregiver or the child. We note, however, that although determinations about maltreatment status were primarily based on caregiver reports, they were also informed by research workers who were trained to observe for abuse or neglect and by clinicians' assessments when the study team made child protective service referrals. We also note that rates of childhood maltreatment in E-Risk were similar to rates obtained from studies that used different methods to identify abuse or neglect.²⁸ Despite these limitations, the study has many strengths. These include a large, prospectively assessed, population-representative sample that was studied at a key developmental transition with respect to employment and education trajectories.

Public Health Implications

The transition to adulthood is a critical time in which to ensure that youths obtain adequate educational qualifications and are on a trajectory that will lead to steady, gainful employment. The current findings suggest that young people with histories of maltreatment are at high risk for failing to achieve these developmental milestones. Although the primary objective of the child welfare system is to ensure the safety and permanent placement of children, the US Child Abuse Prevention and Treatment Act of 2003 charged child welfare workers with ensuring child well-being more broadly. Such legislation has prompted closer collaboration between child welfare agencies and the health care system, particularly for youths in foster care,²⁹ but there remains a high level of unmet clinical need³⁰ that is likely to impinge on youths' academic performance. Moreover, collaborations between child welfare agencies and schools have been slow to develop.³¹ If child victims of abuse and neglect had access to effective educational, emotional, and behavioral health services, then such services could reduce the likelihood of school dropout, improve grades and test scores, and increase a young person's chances of obtaining

TABLE 4—Effects of Individual and Family Factors and Adult Involvement on Educational and Employment Outcomes: Environmental Risk (E-Risk) Longitudinal Twin Study, United Kingdom, 1999–2001 and 2012–2014

	Poor Educational Qualifications, OR (95% CI)	NEET, OR (95% CI)
Physical maltreatment	1.20 (0.85, 1.71)	1.44 (1.00, 2.08)
Male sex	1.10 (0.82, 1.47)	0.63 (0.43, 0.92)
Socioeconomic status		
High (Ref)	1	1
Moderate	2.33 (1.52, 3.58)	1.07 (0.60, 1.89)
Low	4.19 (2.65, 6.63)	3.33 (1.89, 5.84)
Youth IQ	0.95 (0.94, 0.96)	0.98 (0.97, 0.99)
Maternal depression	0.92 (0.67, 1.28)	1.16 (0.80, 1.68)
Parental antisocial personality	0.73 (0.51, 1.04)	0.69 (0.46, 1.04)
Parental substance problems	1.37 (0.96, 1.94)	0.98 (0.65, 1.47)
Count youth mental health problems, age 12 y	1.71 (1.48, 1.97)	1.43 (1.21, 1.68)
Adult involvement	0.95 (0.91, 0.98)	0.97 (0.94, 1.01)
Neighborhood poverty	1.08 (0.79, 1.49)	1.22 (0.82, 1.83)

Note. CI = confidence interval; NEET = not in education, employment, or training; OR = odds ratio.

additional educational qualifications. Indeed, our own data indicated that while sex, SES, and childhood IQ accounted for about 30% of the effect of maltreatment on NEET status and education, psychopathology in childhood accounted for another 7% to 9%, suggesting that effective treatment of psychopathology could improve education and employment outcomes for maltreated youths.

Our data also show that the presence of a supportive adult promotes positive educational outcomes. It is likely that socially supportive adults provide information about, and connect young people with, educational and employment opportunities. Such adults may also be role models, showing by example what kinds of jobs or educational opportunities are open to a young person. Because youths with histories of maltreatment are less likely to have such socially supportive relationships than young people in the general population,¹³ they are prime targets for interventions that match at-risk youths with programmatic or natural mentors, as these have been shown to have small but significant effects on academic outcomes that are related to school completion and employment.³² **AJPH**

CONTRIBUTORS

All authors contributed to the interpretation of study findings and to the writing, editing, and final review of the article. S. R. Jaffee and L. Arseneault originated the study design and drafted the article, on which all authors reviewed and commented. A. Ambler conducted statistical analyses. L. Arseneault supervised the study.

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Control and Prevention or the other funding organizations.

HUMAN PARTICIPANT PROTECTION

The Joint South London and Maudsley and the Institute of Psychiatry Research Ethics Committee approved each phase of the study. Parents gave informed consent and twins gave assent when aged between 5 and 12 years and then informed consent at age 18 years.

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